TRAINING BULLETIN)
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USE OF TRAINING AIDS

1. General

A training aid is any tangible, concrete object which is used in training to help the learner grasp the facts, processes, or principles which he must know in a given course of instruction. Too limited a view is often taken on what may constitute a training aid. Training aids include books and magazines; posters, charts, and graphs; films, film strips, and projectors; computers and plotters; mock-ups (synthetic devices simulating operational equipment) and equipment originally designed for operational use but converted to training purposes. Training aids may be said to include a vast number and variety of objects, ranging from an ordinary blackboard fastened to the wall of a classroom to a complete airplane. Too often thinking on training aids is restricted to an authorized list of items for CAP, thus excluding those common everday objects and items which are readily available locally to each unit irrespective of its size. To think exclusively in terms of any list of authorized training aids is to overlook the infinite possibilities for local construction of useful and serviceable devices. It would be unusual, indeed, if the items authorized by the AAF would meet and answer every need and requirement for each instructor. Each organization should expect to supplement locally its stock of training aids if for no other reason than to improve and enlarge upon known methods and materials for training. Each CAP training organization should be alert to its immediate needs and future requirements. On the other hand, the mere accumulation of training aids for show pieces is to be discouraged. Cadets soon lose interest in objects which have no functional value in training. The value of a training aid lies in its direct application to training, and this test must be applied both in requisitioning equipment and in constructing training aids. With this in mind, this Bulletin is designed to present general suggestions on the preparation and use of training aids. Its contents must be general in nature because the specific application which is made of a training aid is determined by the purpose and nature of each lesson. The specific use to which a training aid may be put must be worked out by each instructor for each lesson.

2. General Suggestions for the Use of Training Aids

a. Pertinency of the Training Aid to the Lesson. A training aid is to be used only when it serves a specific purpose in a lesson. Unless a training aid makes a demonstrable contribution to teaching a specific thing, it delays or even reduces efficient learning. When appropriately used, a picture or a mock-up may give understanding to a point in the lesson which thousands of words could not provide. But a training device is inappropriate to a lesson when the instructor misjudges its purpose and value, when he uses it as a filler to substitute for activity on his part, or when he wastes time by permitting the training aid to become an object of casual rather than specific interest for the class. A training aid is not a substitute for work on the part of the instructor. It is a supplement to instruction and must be skillfully worked into the lesson. It becomes an important consideration in preparing the lesson plan previously described in Training Bulletin No. 4. To illustrate the point, let us take as an example the course in instruments given in the CAP Basic Training Program. This course is limited to five teaching hours. It includes a study of the magnetic compass, the altimeter, the airspeed indicator, and the rate-of-climb indicator. When allowance is made for testing at the end of the course, little more than one hour can be given over to learning the principles involved in the actual use which is made of the instruments in the airplane. In this five-hour course the instructor must constantly keep in mind the limited time available, the complicated nature of the instruments, the meager background of his students, and the answer to be supplied to the question, "How does the pilot use these instruments?" To explain the functional purpose of each instrument, cutaways of the actual instruments and/or large synthetic mock-ups are helpful. From observations made of many lessons on the

altimeter, for instance, instructors have been known to become so engrossed in describing the actual construction of the instrument that they have lost sight of the use which is made of it. An instructor is often fascinated by the object, and before he is aware of it, the period has passed without the real purpose of the lesson having been accomplished. The cadets may come away with some appreciation for the mechanical structure of the altimeter - how this part fits into a particular place to produce action on the needle, what types of metals are used in the case and what kind in the internal mechanism - but they will probably have only a vague notion of how readings are taken from the instrument. If a training aid is permitted to hog the show, if it becomes an end rather than a means to an end, its value is limited. When properly used, a training aid serves a specific purpose in a lesson. This purpose may be to learn primarily of its construction, or the primary purpose may be to learn of its use. But when it has served that purpose, the instructor should be done with it, should put it away; and he should not be led astray by an impulse on his part or by random curiosity on the part of the students to play with or talk about it as a gadget. If he does, he probably will fail to achieve the objectives of the lesson or will have to take time from the following lessons, which will suffer accordingly.

b. Visibility and Accessibility of the Training Aid. The size, mounting, and preparation of a training aid affect its value to the learner. This is to say that a training aid when used in a lesson must be visible to every member of the class. Limitations imposed by the size or the number of available objects for distribution and inspection by the class often make it desirable to have small sized classes when heavy reliance in teaching is placed upon the equipment itself. This holds true particularly for classes such as those in engine and instruments. Items of Class 26 and Class 27 equipment which are authorized and available to CAP may be mounted, exploded, and/or sectionalized to make them more accessible and visible in the classroom. An engine which is placed upon a stationary platform in the corner of a room cannot be utilized efficiently in teaching. If this engine is mounted on a platform made of wood, or, better still, of steel tubing with rollers fitted to the legs or base of the mounting, the engine may then be moved to the front of the classroom when it is needed, and may be rolled out of sight when it is no longer required. It may then be moved about freely with the advantage of being readily visible to every member of the class. To make visible the internal mechanisms of an engine or any complicated piece of equipment, effort should be made to expose its internal structure by having it partially sectionalized. By sectionalizing a cylinder, for instance, its structure as well as the action of the piston and the valves in the combustion process may be clearly demonstrated through actual visualization of what takes place when the engine is operating. In the same way many other parts of an engine can be made accessible to the eye by removing a surface plate or by cutting out a section of a case. If power tools are available, sectionalizing is somewhat simplified. If an ordinary hack-saw must be used, the process is admittedly arduous and slow, especially when it comes to sectionalizing engines. But once accomplished, the value of the equipment is increased immeasurably as a training aid. While a sectionalized engine mounted on a movable platform has proved to be a highly successful way of displaying an engine to a class, the so-called exploded method of display may also be used with good results. To explode an engine is partially to disassemble the engine into its component sections or units and mount them in an extended manner on a stationary platform. Compared to an engine completely assembled, an exploded engine affords vastly increased visibility to its parts. Instruments are usually more easily sectionalized than are parts of an engine, although it is a somewhat delicate operation. All or part of an instrument case may be removed, but it is advisable to construct a transparent covering as a substitute, such as one made of plexiglass. The plexiglass covering permits the student to see the interior but prevents his toying with the mechanism, which often results in damage to it. In preparing training aids, then, the point of view of the student in the classroom should always be kept in mind. The one question to ask is, "How can understanding on the part of the learner be increased by making all the parts of this item more accessible and visible to him?"

c. The Use of Training Films and Film Strips. Some training aids may be more useful at one time and place in a lesson than they are in another. This is particularly true of training films and film strips. No hard and fast rules can be made for the use of these visual aids, but their values and limitations should be thought through before they are employed. A "movie" should not be used as a substitute for personal instruction simply because it presents an easy and presumably a more interesting way to conduct a class. It obviously is misused when it is a filler. Nor should it be used simply because it is a presentation of the general subject under consideration. After all, training films or film strips have not been planned with the exact purpose or subject matter of a particular CAP course in mind. Most of the films used in CAP are obtained from the army, and they were especially planned to suit the purposes, detail of treatment, and technicalities which were required by the army for its courses. Even so, army instructors make judicious rather than indiscriminate use of them. In general, training films on subjects in navigation, engines, weather, etc. have proved useful primarily to introduce the subject or to summarize either the subject or some phase of it. If the treatment of a subject in a training film is broad in scope, easy to grasp, and very interestingly developed, the film probably is most useful for introducing the students to a subject or a phase of a subject which is to be studied. If the training film treats of the subject in a more technical manner, it definitely should be preceded by instruction. When a training film is shown, the continuity of instruction proceeds without reference to the speed of the individual student's comprehension. Whether he "got it" or not, the film moves on. To be sure, the films are planned by experts and pitched to what is assumed to be an average intelligence. But it still is a mechanical thing which cannot take cognizance of individual differences as can an instructor, for whom every puzzled facial expression and every evidence of restlessness has meaning. To repeat, training films which are technical in part or in entirety should be used to summarize a subject or some phase of it, for the student is then in a position to follow the sustained tempo of his mechanical master. It might be said in passing that films are often capable of doing a better job of summarizing than are most teachers. Every training film, then, should be pre-viewed by the instructor several times, not only to study its subject matter but to study it for the best place and way in which it may be used in the lesson. The highlights of the film should be noted in these previews. Just prior to showing it to the class, the instructor should present a short introduction of what the students are to see in the training film. To be certain that they will not miss its essential features, the instructor will find it effective to list on the blackboard exactly what he wants them to look for in the film. Following the showing, he should conduct a short discussion period in which he may ask questions to discover if the students actually did see and understand what he wanted them to learn. Film strips, on the other hand, are more readily introduced into a lesson. They can easily be made to fit into a given part of a lesson. The instructor can "hold" the frame for any desired length of time, and with the aid of a pointer he can lecture or carry on a discussion with the class about it. A film strip combines personal instruction with good visualization of what is being taught. Its disadvantage is its static character. In general, it is good advice not to overwork either training films or film strips. Irrespective of how varied they are, both training films and film strips become extremely boring to students when shown often. Avoid long films. It should be flattering for the instructor to know that in the long run flesh and blood teaching still has advantages over the "canned" presentation of material.

d. The Blackboard as a Training Aid. One of the most frequently overlooked items for its value as a training aid is the blackboard. This is particularly true when the instructor is inexperienced, for it should be said that the veteran instructor almost invariably experiences a deep sense of helplessness in the absence of a blackboard. A blackboard with an ample supply of chalk of many colors is a "must", a minimum necessity in classroom training. While "canned" charts are most helpful and are not to be disparaged, a blackboard diagram constructed step by step in the presence of the class can be even more useful in helping the cadet to grasp a principle or to see the picture. The chart often presents the outline or picture of a structure in its totality and complexity. A schematic drawing on the blackboard can be built up part by part in a way which permits the cadet to understand relationships, and permits the instructor to teach the structure with full consideration

for the learning problems of the class. Colored chalk makes prominent those structures and processes which need emphasis. A drawing which is built up in the presence of the class and followed by showing a complete and more technically perfect chart is often a good way in which to present information. This has the advantage of carrying the student along in his learning until he is prepared to see and comprehend the totality of the structure or process. All this is true, of course, if the instructor develops proficiency in working at the blackboard. Skill in drawing can be acquired with practice. The capacity to write and draw in large, clear figures and letters is readily developed. In short, no instructor can afford to separate himself from the blackboard in CAP Training. In some instances, the blackboard will be the only training aid which is suitable to his purpose. In almost every instance the blackboard is a necessary complement to other training aids.

e. Developing Interest Through Attractive Display of Training Aids. If a CAP Unit has secured exclusive use of rooms for training, much can be done with training aids to develop "atmosphere" which will result in increased interest. Training aids which are carelessly pushed against the wall or stacked in the corner will give them the appearance of junk. A few examples will serve to illustrate the possibilities for orderly and attractive display of training aids. Instead of having parts of engines such as gears, switches, spark plugs, etc. scattered around on a bench, these parts may be clipped to a large display board attractively painted in white with the nomenclature of each item painted in black below it. If this board is hung near the front of the classroom, it not only makes an attractive display, but each part is then immediately accessible to the instructor who can remove it with ease when it is required in a lesson. If wall space permits, an aeronautical chart of the entire United States can be constructed by joining the several sectional charts into an attractive wall display. Model airplanes can be suspended from the ceiling by means of wire. Glass cases or even ordinary shelves fastened to the wall present possibilities for the attractive display of model airplanes, globes, instruments, etc. Commercial charts of engines and instruments are obtainable and may be put to good use in formal instruction as well as for display on the walls. It is not possible or necessary here to indicate the many ways in which equipment may be displayed, but to overlook the value of an attractive display of training aids is to fail in taking full advantage of them.

3. Sources of Information on the Preparation and Use of Training Aids.

a. Many ideas on the preparation and use of training aids may be obtained from publications of various sorts. Popular magazines often present plans and suggestions both on how to construct training aids and on how to use them with maximum effectiveness. Libraries of AAF installations or an AAF Training Aids Officer have copies of catalogs and bulletins published by the Training Aids Division of the Army Air Forces. These are replete in suggestions, charts, and diagrams pertaining to training aids, and many of these ideas are applicable to CAP training. AAF Manuals which are a part of CAP libraries or which may be requisitioned include those on How to Use Film Strips and How to Use Training Films. Technical Orders which apply to any given equipment are useful in learning about equipment and for study prior to sectionalizing it.

b. Visits to AAF installations, airplane factories, aeronautical schools, and vocational schools present opportunities for learning about ways to prepare and use training aids. Unless the individual charged with sectionalizing equipment has had considerable experience in doing this work, it is almost imperative that he visit one or more of these places to inspect cutaway equipment and to obtain the benefit of the experiences of others who have undertaken such jobs. Unless the sectionalizing or disassembling of equipment is performed with understanding and some skill, the equipment may be rendered unservicable for instruction. Almost every community has someone who possesses a general skill and ability in doing this work, if he will but proceed with a clear understanding of the specific purpose of the task and of the mechanical problems involved.

c. Units should not hesitate to call upon training officers in higher echelons and AAF-CAP Liaison Officers for whatever advice and suggestions they may have to offer. These officers have opportunities to visit many or all of the units in the Wing. From their observations of several units may come valuable tips and suggestions for each individual unit on how to develop, prepare, and use training aids efficiently.

BY ORDER OF THE ACTING NATIONAL COMMANDER:

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